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EPA

Total Petroleum Hydrocarbons (TPH) in Soil Subgroup

RTDF

Remediation Technologies Development Forum

Current RTDF Action Teams

- Bioremediation Consortium
- IINERT Soil-Metals Action Team
- Permeable Reactive Barriers Action Team
- Phytoremediation of Organics Action Team
- Sediments Remediation Action Team

The TPH Subgroup was formed by the Phytoremediation Action Team to determine the effectiveness of phytoremediation in degrading aged petroleum hydrocarbons in soil at multiple locations under various climate conditions. The Subgroup's mission is to combine expertise, technologies, and resources to conduct phytoremediation field tests for degradation of petroleum hydrocarbons in order to develop guidelines for future applications and to gain public and regulatory acceptance.

Accomplishments

The Subgroup has developed a suggested standardized protocol, "Phytoremediation of Petroleum Hydrocarbons in Soil," for use in field testing phytoremediation technology. The protocol includes information on designing and evaluating test sites to obtain data to assist regulators in determining whether or not phytoremediation is a viable treatment.

A working draft of the protocol is available on the Phytoremediation of Organics Action Team home page on the RTDF Web site (www.rtdf.org). The protocol suggests that each test site have four randomized test blocks, each containing an unplanted control plot that would be kept weed free, a native plant species plot, and a plot with a standardized mix of rye, legume, and fescue. The protocol includes recommendations on standard:

- plot size, replications, and statistical approach
- soil and plant sampling techniques
- plant growth and hydrocarbon analysis techniques
- assessment of soils for bacterial hydrocarbon degraders
- sampling times over a three-year period

In addition, the protocol includes attachments that expand on (1) seeding mixture; (2) soil sample collection; (3) vegetation sampling, storage, and shipping method; (4) microbial analysis; and (5) plant assessment.

The Subgroup is currently involved in field projects at nine sites in Alaska, Arkansas, California, Kansas, Ohio, New York, and Rhode Island. Each of the projects is using the protocol developed by the Subgroup. Field activities at California, New York, Ohio, and Rhode Island sites are being supported, through Cooperative Research and Development Agreements (CRADAs), with funding and/or in-kind services from participating Subgroup members. CRADAs are designed to encourage partnerships involving government agencies, private industry, and academia. A similar agreement is in process to

support the Arkansas project. Activities at the Kansas site and the three Alaska sites are funded primarily by the U.S. Department of Defense's Environmental Security Technology Certification Program (ESTCP).

Subgroup Members

Membership in the TPH Subgroup is open to representatives of industry, government, and academia who are interested in promoting phytoremediation as a technology used to remediate TPH in soil. Organizations currently represented in the Subgroup include:

Amoco Research Center
ARM Group
Chevron Corporation
Exxon Product Research
Exxon Research and Engineering
Microbial Insights, Inc.
Phillips Petroleum Company
ThermoRetec, Inc.

U.S. Army Cold Regions
U.S. Environmental Protection Agency

Kansas State University
University of Arkansas
University of Oklahoma
University of Tennessee
University of Washington

Subgroup members get together frequently via conference call to share information and discuss progress of activities. Formal meetings are held as needed and are often co-located with other related conferences. Members who sign CRADAs to participate in specific field activities must agree to:

- Commit 3-5 years to the project
- Participate in periodic conference calls and attend annual or biannual meetings
- Provide test sites
- Adhere to the minimum requirements outlined in the Subgroup's protocol.

For More Information

More information on the TPH Subgroup can be obtained at the RTDF web site, or by contacting the Subgroup Co-Chairs.

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